


Report No. 40

WASTE MANAGEMENT PRACTICES OF RSR CORPORATION

February 14, 1994

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prepared for:

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SUMMARY

RSR Corporation operates secondary lead smelters in City of Industry, California, Indianapolis, Indiana, and Wallkill, New York. At all three of these facilities, soil and ground water are contaminated as a result of past waste management practices and air emissions. Two closed lead smelters formerly operated by RSR in Dallas, Texas, and Seattle, Washington, are also contaminated and are now being cleaned up under the Superfund program.

This report presents the results of an independent survey of waste management practices of RSR Corporation and its operating subsidiaries. The purpose of the survey was to develop a comprehensive understanding of RSR's practices concerning waste management and remediation of soil and ground-water contamination, and to recommend ways for regulatory agencies to improve RSR's environmental performance. The study was conducted for the United Steelworkers of America by Disposal Safety Incorporated. Advice was obtained from outside counsel and consultants on interpretation of laws and regulations.

Our review is based on documents from the files of state and federal regulatory agencies. We were not able to review all regulatory files because of time limitations and because some files are currently being withheld from public access during enforcement actions. We also did not interview company employees, enter the facilities, or examine internal company files. There may be other waste management problems, in addition to those discussed in this report, which we were not able to identify because of these limitations.

The history and current practices at RSR's facilities display a consistent pattern of massive resistance by legal and illegal means to efforts to investigate and clean up environmental problems.

A clear pattern of behavior emerges, followed repeatedly at all RSR sites. The company has operated hazardous-waste units without legal authorization under the Resource Conservation and Recovery Act (RCRA) or, when units are authorized, has failed to comply with the most basic requirements of RCRA. When cited for violations, it has either raised legal objections or sought variances, all the while failing to correct the violations and operating under the conditions for which cited. After years of enforcement activity, during which the same violations have been repeatedly cited by regulators, RSR has agreed in signed consent decrees to correct the violations. RSR has then failed in large measure to keep these agreements. In particular, RSR has repeatedly delayed expensive corrective action by failing to fully investigate its contamination problems, in defiance of the consent decrees.

RSR has been repeatedly penalized and in one case was convicted of a crime for this behavior, but the penalties have been far smaller than the cost of the clean-up activities that RSR has succeeded in delaying into the indefinite future.

Major areas in which RSR currently appears to be out of compliance with requirements of hazardous-waste management laws include the following:

- Comprehensive corrective-action investigations have not been carried out as required in California and Indiana.
- The company's financial assurance for closure of its hazardous-waste units in New York does not appear to provide sufficient funds to meet the likely cost of closure.
- Slag is shipped from California to Indiana without hazardous-waste manifests that appear to be required by California law.
- All three plants appear to dispose of spent emissions control bags and contaminated personal protection equipment in the smelters without permits for thermal treatment of hazardous waste.

It is important to ensure that sufficient financial resources will be available to clean up existing and future contamination at RSR's plants. Otherwise, this burden could fall on the taxpayer. The combined net assets of RSR and its parent company are, as we understand it, less than \$70 million. Thus an average of less than \$14 million per site is available to clean up RSR's five smelters and pay other environmental costs. At the two smelters where reasonably complete information is available, clean-up costs appear to be at least \$10 million to \$20 million per site.

The pattern of resistance to environmental regulation demonstrated by this report calls for enforcement to be coordinated at the national level. We recommend that USEPA, working with state governments, bring RSR into full compliance with the law through its Multimedia Enforcement Initiative.

NOTICE

This report is not intended for use in any real estate or other transaction, and should not be used or relied upon for such purposes.

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1. Introduction

1.1 Scope of the report

This report presents the results of an independent survey of waste management practices of RSR Corporation and its operating subsidiaries. The purpose of the survey was to develop a comprehensive understanding of RSR's practices concerning waste management and remediation of soil and ground-water contamination, and to recommend ways for regulatory agencies to improve RSR's environmental performance. The study was conducted for the United Steelworkers of America by Disposal Safety Incorporated. Advice was obtained from outside counsel and consultants on interpretation of laws and regulations.

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1.2 Corporate history

RSR Corporation owns and operates secondary lead smelting plants. It was formed in 1970 in Newark, New Jersey, and a year later purchased Revere Smelting and Refining Corporation/Murph Metals in Dallas. In 1972, RSR purchased Quemetco, Inc., which owned and operated four other secondary lead smelters. Two years later, the Federal Trade Commission (FTC) filed an antitrust complaint against RSR. This case went to the U.S. Supreme Court, where RSR's appeal was denied, and divestiture of the Indianapolis, Indiana, Wallkill, New York, and City of Industry, California, plants was ordered no later than November 16, 1982.

RSR filed a petition for relief with the FTC in 1981, whereupon the FTC modified the divestiture order. RSR was allowed to keep the Indianapolis, Wallkill, and City of

Industry plants and agreed to divest the Dallas and Seattle smelters. The Murrumbidgee Corporation was formed at this time to purchase the assets of the Dallas facility.

In September, 1983, the FTC modified the Order to Divest once again, appointing a Trustee with the power to sell the Dallas plant. RSR was required to pay \$175,000 in civil penalties for failing to meet the original divestiture deadline. In 1983, RSR suspended operations at the Dallas and the Seattle facilities. That same year, the Murrumbidgee Corporation acquired the Dallas plant and Bergsøe Metal Corp., a Danish-owned company that operated a competing secondary lead smelter in Oregon, acquired the Seattle plant.

The FTC's approval of the modified divestiture was premised on promises to operate the two facilities. However, the Dallas plant never resumed operation and the Seattle plant operated for only a few days under the new ownership. RSR still owns the three plants that continue to operate.

RSR also remains liable for clean-up costs at the two closed facilities under the Superfund laws.

1.3 Operations

RSR's primary business operation is recycling scrap lead, most of which (approximately 90%) arrives in the form of spent automobile and truck lead-acid batteries. The processes involved in this business include storing incoming lead batteries, cracking them, sizing and separating the parts, storing and treating waste, lead smelting, and fabricating the recovered lead into foil and bars. The plastic parts of battery casings are either cleaned and sold or disposed of off-site. Acid from the batteries is neutralized or, reportedly, used to clean the plastic parts. Reverberatory and electric-arc furnaces are used to melt the scrap and separate out the lead. Waste products from the smelting process include slags and drosses. Some of these are also disposed of off-site.

Operations at RSR smelters produce a variety of RCRA hazardous wastes. The major hazardous wastes of concern include lead and lead-containing materials (D008), emission

control dust from lead smelting (K069), and corrosive materials (D002) such as sulfuric acid from lead-acid batteries.

An affiliate, Bayou Steel Corporation, operates a secondary steel smelter in LaPlace, Louisiana. This company is the subject of a separate environmental audit by Disposal Safety Incorporated.¹

Environmental compliance activities of RSR, its subsidiaries, and its affiliate appear to be centrally coordinated. Regulatory filings and legal briefs are frequently submitted from the corporate headquarters in Dallas rather than from the individual plants.

2. Dallas, Texas

The RSR Corporation Superfund Site in Dallas, Texas, is one of the most notorious Superfund sites in the country. This site has received national attention as a symbol of the way poor and minority neighborhoods suffer disproportionately from lead poisoning and industrial pollution. The RSR Site has attracted attention because elevated lead levels in children's blood have been documented and the source of the lead seems obvious. Between the expected clean-up costs and potential judgments from two class-action lawsuits, RSR's environmental liabilities stemming from this site are potentially enormous. Among the RSR facilities, this is perhaps the clearest example of the company's willingness to fight regulators, and even shut down, to avoid the cost of complying with environmental regulations.

2.1 Background and setting

In 1971, RSR acquired Murph Metals, the owner of a Dallas lead-smelting facility that had been in existence since 1934. RSR/Murph Metals operated the facility until 1983, but discontinued operations when ownership was transferred to the Murmur Corporation

¹Environmental audit: Bayou Steel Corporation, Disposal Safety Incorporated Report 39, December 1993.

under a Federal Trade Commission antitrust divestiture order. In May, 1993, the facility and surrounding residential area were proposed for listing as a federal Superfund site because of severe contamination by lead, cadmium, and arsenic.

The RSR/Murph Metals smelter was located in a mixed residential and light industrial section of west Dallas, south of the Trinity River. The Superfund site consists of several sub-areas: the buildings and land associated with the smelter; the adjoining residential area which includes private housing, public housing, and small commercial establishments; and additional nearby parcels of land where RSR/Murph Metals dumped, stored, and performed operations on lead-containing material and wastes.

Operations at the facility included lead smelting, fabrication, battery cracking, plastic and rubber reclamation, landfill operations, and acid neutralization.

2.2 Environmental and regulatory history

USEPA's Conceptual Remedial Investigation/Feasibility Study (RI/FS) Workplan² for the RSR Corporation Superfund Site provides the basis for the following account of regulatory and environmental problems at the facility:

In the 1970s and 1980s, health studies and surveys of neighborhood children showed that lead levels in their blood were elevated. An analysis of blood lead levels conducted in 1983 indicated that approximately 5% of the children under 6 years of age and living within a one-half mile radius of the RSR/Murph Metals smelter had blood lead levels equal to or greater than 30 $\mu\text{g}/\text{dl}$. (The current level of concern set by the Centers for Disease Control is 10 $\mu\text{g}/\text{dl}$.)

Sampling conducted in 1982 showed that areas of soil near the smelter had average lead concentrations as high as 3,000 mg/kg, caused primarily by stack emissions. In 1983, the Texas Air Control Board and the City of Dallas sued RSR/Murph Metals in connection

² Conceptual RI/FS work plan, RSR Corporation Superfund Site, operable unit no. 4, prepared by CH2M Hill for USEPA, July, 1993.

with the soil and air contamination. The case was settled in October, 1983, by judicial and administrative consent orders in which RSR/Murph Metals agreed to fund a soil clean-up of its property and the surrounding residential areas, identify and treat lead-related health problems in the surrounding community, and upgrade its emissions control system to reduce airborne lead emissions. In 1984 and 1985, a court-appointed Special Master operating under the consent order supervised the clean-up of soil containing more than 1000 mg/kg of lead within 1/2 mile of the plant.

Meanwhile, the Texas Department of Water Resources began enforcement actions in August, 1983, for violations of state industrial solid waste regulations. At the end of 1983, the City of Dallas refused to renew RSR/Murph Metals' operating permit. On February 29, 1984, according to the USEPA Work Plan, "RSR Corporation shut down smelter operations because of a stated inability to comply with the court-ordered pollution control measures."³

Murmur Corporation acquired the RSR/Murph Metals Dallas facility in 1984, but was never able to reopen the smelter because of existing violations of environmental regulations. Although initially efforts were made to address these problems, relations between Murmur and the regulators became contentious. In 1987, Murmur was informed by the Texas Water Commission that an operating permit would be denied. Finally, in June of 1991, the Texas Attorney General decided that progress at the site was so poor that the case should be referred to the federal Superfund program for assessment, stating: "All RCRA remedies have been exhausted and we believe that no further progress towards remediation of the site can be accomplished through litigation."⁴

In 1991, the USEPA began to investigate the site at the request of the Texas Water Commission. Soil sampling found extreme levels of contamination in the residential areas due to airborne smelter emissions and the use of lead slag and battery chips as fill. The contaminated area includes private residences, a public housing project, and local commercial properties. In late 1991, USEPA began an on-going emergency removal action of more than 500 lots and alleys; these include schools, playgrounds, parks, and private residential properties. The action targets soil containing greater than 500 mg/kg lead, 20 mg/kg

³*Ibid.*, p. 2-10.

⁴*Ibid.*, p. 2-14.

arsenic, or 30 mg/kg cadmium. A removal action at the public housing project is planned, but has not yet begun.

In May, 1993, the RSR/Murph Metals Dallas facility was proposed for listing on the National Priority List as the RSR Corporation Superfund Site. RSR is the principal Potentially Responsible Party (PRP). The site is subdivided into five operable units to better manage the extensive contamination. A large portion of the Superfund site consists of residential areas. Another portion consists of RSR/Murph Metals' properties; these include the smelting facility and five other tracts of land containing slag dumps, treatment areas, and a municipal landfill. On-going investigations by USEPA have further verified extensive on-site and off-site contamination. A Remedial Investigation/Feasibility Study is underway and a Record of Decision is due in mid-1994.

Remediation at this site will be costly. There are five operable units. Newspaper reports quote an unidentified consultant's report as estimating the cost of lead clean-up at the public housing project, which is only one of the five operable units, at \$8 million to \$25 million.⁵ Other operable units include the smelter, which is still standing, extensive slag piles, and various residential and industrial properties.

2.3 Effect on community and litigation

The local community has expressed outrage over the RSR/Murph Metals facility. Complaints about the smelter date back to at least the 1970s. A community group called PEACE Environmental was recently formed to address problems caused by the smelter. This group organizes the community, publishes a newsletter and, under a grant from the USEPA, has hired a toxicologist to monitor the progress of the clean-up.

Two major toxic tort actions have been filed against RSR, RSR's affiliates, and Murrum Corporation. These are class action suits on behalf of over 400 minority children

⁵R. L. Loftis and C. Flournoy, New project, old problems, *Dallas Morning News*, May 9, 1993. The newspaper said that this work would be paid for from HUD funds, but the subsequently proposed listing of the site on the National Priorities List increases the likelihood that RSR will be made to bear some or all of these costs.

and other individuals who live within the city of Dallas. They seek to recover damages for severe past and present medical problems, as well as foreseeable future medical complications, caused by contamination of the neighborhood. Although a specific sum for damages has not been requested, an award of \$50,000 per plaintiff, which would not be a large amount of compensation for neurological damage to a child, would require a total payment of more than \$20 million. RSR is also the subject of a related suit by its insurance carriers, Employers Casualty Company and Employers National Insurance Corporation, who have asked the court to rule that RSR, not the insurance carriers, be solely liable for damages to the neighborhood and its residents.

Media interest has been intense. Since 1981, there have been numerous articles and editorials in newspapers and magazines discussing the RSR Dallas facility. A list of these publications submitted by RSR in connection with the class-action lawsuit contains more than 100 citations.

Because the neighborhood surrounding RSR/Murph Metals is economically poor and composed predominantly of people of minority background, the lead contamination at the RSR Superfund Site has received national political attention. It has been the subject of a U.S. Department of Justice investigation and Congressional hearings in connection with the issues of environmental equity and environmental justice.

3. Harbor Island, Washington

RSR's Harbor Island facility in Seattle, Washington, has a history similar to the Dallas facility. The major difference is the setting -- it is located in an industrial park that is relatively distant from residential areas. This site further illustrates the company's willingness to shut down rather than comply with regulations. The clean-up costs associated with this facility also add a considerable sum to RSR's total potential environmental liability. The following description of the site is based largely on USEPA documents.⁶

⁶The proposed plan for cleanup, Harbor Island Superfund Site, Seattle, Washington, U. S. Environmental Protection Agency, June, 1993; Superfund fact sheet, Harbor Island Superfund Site, Seattle, Washington, U. S. Environmental Protection Agency, November 3, 1993.

Harbor Island is located in Seattle, at the juncture of Elliot Bay and the Duwamish River. The 430-acre island has been an active industrial park since it was artificially created from dredge material approximately 90 years ago. RSR/Quemetco is one of many industrial facilities located on the island. RSR acquired the secondary lead smelter as part of its acquisition of Quemetco in 1972 and operated it until 1984. According to the Remedial Project Manager for the Harbor Island Superfund Site, the RSR/Quemetco plant ceased operations shortly after USEPA and local regulators determined that it was exceeding lead emissions standards for air and should upgrade its emission control systems.⁷

In 1983, Harbor Island was declared a federal Superfund site. USEPA states that the Superfund designation was "due to elevated lead concentrations in the soil from [RSR/Quemetco's] lead smelter on the island, which ceased operation in 1984, as well as elevated levels of other hazardous substances."⁸ Lead is the most significant inorganic contaminant and is found over most of the island, making RSR/Quemetco one of the principal potentially responsible parties (PRPs).

USEPA has selected a clean-up plan for the island that is estimated to cost approximately \$40 million. Approximately \$15 million of this total will be required to build a cap for contaminated soil, of which lead-contaminated soil forms a major part. Following the recent issuance of a Record of Decision, USEPA will be offering PRPs an opportunity to negotiate responsibility for clean-up activities and apportionment of costs. Although the apportionment remains to be worked out, RSR/Quemetco as the major emitter of lead may have to bear much of the cost of capping.

4. Indianapolis, Indiana

At the Indianapolis facility, RSR's resistance to the efforts of regulators has had a certain degree of success. RSR won a legal battle to have most of its hazardous waste exempted from regulation and is now contesting some of the provisions in its recently issued

⁷Keith Rose, USEPA, oral communication, January 4, 1994.

⁸Proposed Plan, p. 3.

RCRA permit. RSR has been less successful in its efforts to avoid legal responsibility for corrective action, but has made little progress toward actually starting the clean-up.

4.1 Background

The RSR secondary lead smelter in Indianapolis, Indiana, owned and operated by its subsidiary Quemetco, Inc., was built in the 1970s. It is located on the west side of Indianapolis, near a creek, in a mixed residential and industrial neighborhood.

Reverberatory and electric arc furnaces, which use spent lead-acid batteries and slag as their feedstock, are used in the smelting operation. Some of the slag fed into the electric-arc furnace is "second run" slag originating from RSR's City of Industry and Wallkill plants.

The facility is currently regulated by both the Indiana Department of Environmental Management (IDEM), which administers the base RCRA program, and the USEPA, which administers the RCRA corrective action program in Indiana. In July of 1992, RSR/Quemetco was issued a joint RCRA permit by USEPA and the State of Indiana. RSR/Quemetco is currently contesting certain conditions in the federal portion of the permit.

4.2 Hazardous waste compliance history

The RSR/Quemetco Indianapolis facility has a long history of conflict with IDEM and USEPA and has repeatedly used legal maneuvers to reduce or eliminate its environmental compliance responsibilities. Only after lengthy judicial battles did RSR/Quemetco agree to comply with the requirements of the law. Although most of RSR/Quemetco's attempts to resist regulation were unsuccessful in the end, the company did persuade the state's Solid Waste Management Board, over strong objections by state regulators, that spent lead-acid batteries stored inside its smelter building are not hazardous waste.

The pattern of non-compliance citations at Indianapolis is very similar to other RSR operations, including illegal disposal of hazardous waste, operation of unpermitted hazardous waste management units, lack of financial assurance, failure to monitor ground water, lack of adequate closure plans, and operation of a hazardous waste management unit after its

authorization (interim status⁹) was terminated. Only after a multi-year struggle with IDEM and USEPA did RSR/Quemetco agree to a comprehensive compliance order that required it to apply for a permit and perform corrective action at the facility. A permit has been issued, but its terms are currently under appeal by RSR/Quemetco, and EPA's opinion is that the first stage of RSR/Quemetco's corrective action, an investigation, omits major elements required by the compliance order.

IDEM files pertaining to hazardous waste show that the battle between regulators and RSR/Quemetco reached its first climax in 1983.¹⁰ In that year, IDEM issued an order for numerous violations, including:

- Failure to have a permit for managing hazardous waste in containers, waste piles, and surface impoundments
- Lack of a ground-water monitoring system
- Failure to protect hazardous waste piles from wind dispersion and control leachate and runoff
- Lack of adequate hazardous waste analysis plan
- Lack of adequate personnel training documentation
- Lack of an adequate contingency plan
- Failure to properly conduct and document inspections
- Failure to follow proper manifest procedures for shipment of hazardous waste
- Operation of an open dump.

RSR/Quemetco claimed that the material in question was not hazardous waste and pursued an administrative appeal, which was not decided until 1991.

⁹ Interim Status is provisional authorization to operate a hazardous waste management facility pending final administrative action on the facility's operating permit application.

¹⁰The files show that RSR battled other government agencies, including Marion County and the state Board of Health, over the same issues as early as 1979.

From 1984 to 1989, IDEM conducted yearly inspections. After each inspection, violations were referred to the enforcement office, which was vigorously pursuing the case. The violations were repeated consistently and included continued operation of non-permitted hazardous waste management units, inadequate inspection, lack of a ground-water monitoring system, failure to have adequate financial assurance, failure to submit a closure plan, and releases of hazardous waste into the environment. Because RSR/Quemetco failed to correct the alleged violations during the 8-year course of the controversy, the IDEM proposed an astronomically large civil penalty of *\$455 million*. Before the controversy had been resolved, however, IDEM and RSR/Quemetco reached an agreement that even if IDEM won, the penalty would be reduced to *\$225 thousand*.

In 1991, a ruling on the 1983 citation was finally issued by the state Solid Waste Management Board. All wastes stored inside the smelter building, including spent lead-acid batteries, slags, waste corrosive liquids, and emission control dust, were universally classified as non-hazardous. However, a pile of hard rubber automobile battery casing parts outside of the building and four other previously identified illegal waste piles remained classified as hazardous.

The Board's ruling seems markedly at variance with RCRA regulations as intended, written, and interpreted by USEPA. In reclassifying spent-lead acid batteries as a nonhazardous waste, it is inconsistent with and much less stringent than the federal requirements.¹¹ While the USEPA has established reduced requirements for persons who reclaim lead-acid batteries,¹² the very fact that these requirements are contained in a section (40 CFR 266) entitled "Standards for the Management of Specific Hazardous Wastes and Specific Hazardous Waste Management Facilities" in itself clearly demonstrates that USEPA classifies spent lead-acid batteries as hazardous waste.¹³ EPA has stated specifically that

¹¹Spent lead-acid batteries are classified by USEPA as spent materials that exhibit the characteristics of corrosivity (the electrolyte) and toxicity (the lead). Because the batteries are reclaimed, and under 40 CFR 261.2(c)(3) both listed and characteristic spent materials being reclaimed are solid waste, the batteries are both solid and hazardous waste.

¹²The Board's order agrees that RSR/Quemetco reclaims spent lead-acid batteries.

¹³40 CFR 266.80 requires persons who reclaim spent lead-acid batteries to follow the provisions of 40 CFR 266 subpart G. USEPA has always interpreted the rules to mean that whoever cracks a spent lead-acid battery is the reclaimer. The regulations require reclaimers to comply with the

spent lead-acid batteries are regulated as a hazardous waste when stored by the person reclaiming them, *either a battery cracker or a secondary lead smelter*.¹⁴ In this case, RSR/Quemetco is both, leaving no questions as to the status of the batteries.

The Board's conclusion that spent lead-acid batteries are not hazardous waste is predicated on three points concerning the building housing the operations: (1) it meets the definition of a totally enclosed treatment facility, (2) it meets the definition of a manufacturing process unit, and (3) it meets the definition of a tank. These findings are inconsistent with both the ordinary meaning of the English language and the specific wording and intent of USEPA regulations.

First, the building in which the spent lead-acid batteries and furnaces are located is classified by the Board as a "totally enclosed treatment facility." This conclusion appears to be based on RSR/Quemetco's assertion that the building is both constructed and operated in a manner which prevents the release of hazardous waste into the environment. But a furnace which releases gas through a stack is not considered by USEPA to be totally enclosed.¹⁵ Moreover, previous IDEM inspection reports have noted that RSR/Quemetco has operated the furnaces with the building doors open and allowed releases of hazardous waste onto surrounding soil and into the air.

requirements for hazardous waste storage. The Board admits that storage occurs, but contends that it is minimal and can therefore be neglected. However, regardless of whether storage is short term or longer (e.g., temporary shut-down of operations), USEPA has made it quite clear that the storage of lead-acid batteries just prior to the reclamation process is subject to certain regulatory controls and *must* obtain a permit. See 40 CFR 260.10, 264.1(b), 264.1(g)(2), and 270.1(c).

¹⁴50 *Federal Register* 649 (January 4, 1985).

¹⁵In 40 CFR 260.10, USEPA defines a "totally enclosed treatment facility" as "a facility for the treatment of hazardous waste which is directly connected to an industrial production process and which is constructed and operated in a manner which prevents the release of any hazardous waste or any constituent thereof into the environment during treatment. An example is a pipe in which waste acid is neutralized." The furnace stack at RSR/Quemetco is equipped with a baghouse which is not 100% efficient in preventing release of lead. Furthermore, in OSWER Directives 9432.01 and 9432.02, USEPA states that in order for a unit to meet the definition of a totally enclosed treatment facility, it must be connected *directly* to an industrial process. The building is not connected to an industrial process; it surrounds many processes. Consequently, a building providing cover and protection for a lead smelter cannot satisfy USEPA's definition of a totally enclosed treatment facility.

The building is also classified by the Board as a manufacturing process unit. However, under USEPA's rules a large building containing a smelter and numerous processes does not satisfy the definition of a manufacturing process unit. Although there is no explicit definition of a manufacturing process unit in the federal regulations, associated definitions and concepts in the federal hazardous waste regulations clearly demonstrate that this exclusion was not intended nor applicable for a large building.¹⁶ All definitions pertaining to units in 40 CFR 260.10 describe discrete entities, such as surface impoundments, tanks, incinerators, and landfill cells. A building containing furnaces, waste piles, staging areas, etc. cannot be defined as a unit.

Finally, in the Board's interpretation, the building housing the smelter, process operations, and wastes meets the RCRA definition of a tank by being constructed of steel and accumulating hazardous waste. This is a dubious interpretation of the definition of tank¹⁷ in that (1) the RSR/Quemetco facility was not designed to contain an accumulation of hazardous waste, but to function as a lead smelter, (2) RSR/Quemetco previously managed all hazardous waste in piles outside of the building, and (3) the wood, steel, concrete, and plastic used in the construction of the building does not provide structural support for the accumulation of hazardous waste, but cover and protection for the smelters.

The effect of this Board ruling is to make the rules that Indiana applies to hazardous waste at RSR/Quemetco's lead smelter inconsistent with and less stringent than the rules imposed by USEPA under RCRA. USEPA is required, as we understand it, to revoke authorization of any state to administer RCRA regulation if the state's rules are less stringent

¹⁶The exclusion in 40 CFR 261.4(c) lists associated units that are also eligible for the exclusion, including raw material storage *tanks*, raw material transport vehicles (tanker cars), and raw material *pipeline*. All of these exclusions apply only to raw materials and specific units. Spent lead-acid batteries are not raw materials. USEPA classifies them as hazardous waste (40 CFR part 266). The dictionary definition of "raw" (*Webster's Encyclopedic Unabridged Dictionary of the English Language*, 1983) is "not having undergone processes or preparing, dressing, finishing, refining, or manufacture." Clearly, a manufactured battery about to be processed cannot possibly be defined as a raw material.

¹⁷40 CFR 260.10 defines a tank as follows: "Tank means a stationary device *designed* to contain an accumulation of hazardous waste which is constructed primarily of non-earthen materials (e.g., wood, concrete, steel, plastic) which provide structural support. [emphasis added]."

than USEPA's.¹⁸ If authority to administer RCRA in Indiana reverted to USEPA, or if USEPA undertook an independent enforcement action, waste piles in RSR/Quemetco's smelter building would be classified as hazardous waste storage units and would be subject to relevant regulations, including closure requirements and financial assurance.

4.3 Current status of hazardous waste compliance

Not all of RSR/Quemetco's wastes are exempted from hazardous-waste regulation by the Board's decision. Materials stored outside the smelter building are still considered hazardous wastes, and the company still has not come into compliance with the state's regulations for its handling of these materials. In 1991, IDEM issued an order citing Quemetco for an inadequate hazardous waste analysis plan, inadequate inspection procedures, inadequate emergency procedures, and inadequate operation of a hazardous waste pile (a storage bin). Furthermore, there are several other areas where the facility appears not to have complied with Indiana law.

In July of 1992, RSR/Quemetco was issued a RCRA permit by USEPA and the State of Indiana. RSR/Quemetco is currently contesting certain provisions in the federal portion of the permit. At issue are several provisions standard to RCRA permits. These include land disposal restrictions as they relate to the permissible staging time for hazardous waste and organic air emissions requirements. RSR/Quemetco is also contesting some corrective action provisions that were included in response to concerns expressed by local residents. These require USEPA to hold annual public meetings to discuss site conditions, and for RSR/Quemetco to conduct an off-site investigation of lead levels in residential soil. RSR/Quemetco is arguing that under §3004(v), the USEPA lacks the authority to require such provisions because it does not currently possess sufficient on-site data to demonstrate that there is a high probability that site-related contaminants have migrated off-site. The permit dispute was sent to USEPA's appeals board, which subsequently remanded it to the state.

¹⁸40 CFR 271.4.

4.3.1 Good character

The State of Indiana requires permit applicants to submit specified information in support of a required demonstration of "good character."¹⁹ The permit applicant must provide detailed information pertaining to "all civil and administrative complaints against the applicant for the violation of *any* state or federal environmental protection law" [emphasis added] that have resulted in fines greater than \$10,000 and any pending criminal complaints alleging violation of *any* state or federal laws within five years before the date of submission of the application. If, based on the information provided, the applicant fails to demonstrate good character, the permit may be denied.

When RSR/Quemetco submitted its permit application and good character disclosure form, information only on the Indianapolis plant was submitted.²⁰ A \$60,000 penalty imposed on Quemetco by the State of California as part of a Consent Decree (discussed below in Sections 5.3 and 5.4) was not disclosed.²¹

4.3.2 Bags and gloves contaminated with K069 flue dust

RSR's lead smelters generate spent material contaminated by lead dust, including air-pollution control bags, gloves, and other personal protective equipment. Information available to us suggests that all three plants return this material to the lead melt. Issues concerning the management of this material are similar at all three plants (and also resemble issues at RSR's affiliate Bayou Steel²²), and will be discussed in greatest detail in this section.

¹⁹IC 13-7-10.2.

²⁰J. A. De Paul, Quemetco, Inc., letter to T. E. Linson, IDEM, August 13, 1991. The completeness of this disclosure was reaffirmed in an October 4, 1991 letter from H. B. Myers to Linson.

²¹RSR's Revere Smelting and Refining subsidiary also paid a \$140,000 fine to New York State for air pollution violations. Indiana regulations may have a loophole under which disclosure of this fine was not required.

²²See Note 1.

Bags are used in RSR/Quemetco's air pollution control equipment (a baghouse) to capture most of the emissions from the flue gas before they are released to the ambient air. These bags have a limited useful life and become damaged and spent. The emissions captured in the bags are a listed hazardous waste²³ (K069) because of toxic levels of lead, cadmium, and hexavalent chromium, and therefore the bags are a hazardous waste when they are removed from the bag house.²⁴

RCRA permittees are required to conduct a detailed physical and chemical analysis of waste streams such as the spent bags and personal protective equipment. RSR/Quemetco did, after being ordered by IDEM, conduct a detailed physical and chemical analysis of contaminated personal protective equipment. But we have found no information as to the disposition of spent bags from the bag house.

RSR/Quemetco has informed IDEM that it "reclaims" the spent personal protective equipment by recovering lead in a smelter; we found no information about the disposition of the bags. However, bags and gloves cannot be reclaimed in a smelter because a bag or glove is reclaimed by reusing the material in the original bag or glove, not by reusing a contaminant that was later added to it.²⁵ Under USEPA's criteria for sham recycling, it appears that the bags are not legitimately recycled in a smelter, but are undergoing treatment

²³Quemetco asserts that the flue dust itself is not regulated as hazardous waste because it is returned directly to the smelter through a totally enclosed screw-auger system. It does not appear possible for Quemetco to return the contaminated bags to the smelter through such a "totally enclosed system" because the bags would need to be handled and would have to be processed in some way.

²⁴ These bags are contaminated with a listed hazardous waste (K069) and thus, according to the mixture rule of 40 CFR 261.3(a)(2)(iv) and derived-from rule of 40 CFR 261.3(c)(2), are a hazardous waste. Furthermore, even if the bags are to be reclaimed, they are still considered a solid and thus a hazardous waste in accordance with 40 CFR 261.2(c)(3). This is because K069 is defined as a sludge (sludge is a solid, semi-solid or liquid waste generated from pollution control operations as defined in 40 CFR 260.10) listed in 40 CFR part 261.32. As a result, this waste must be handled in accordance with all applicable requirements for the management of a hazardous waste and must be reported in Quemetco's biennial hazardous waste report.

²⁵ In contrast, washing a glove to remove the lead would reclaim the spent glove; however, the lead removed would be a waste.

or disposal.²⁶ Furthermore, even if the bags and gloves are recycled, as a listed hazardous waste (rather than a characteristic waste) they must still be managed as hazardous waste prior to recycling.²⁷

RSR/Quemetco's biennial hazardous-waste report to IDEM, which should account for the generation and disposition of *all* hazardous wastes generated at the facility, includes no information concerning the generation, storage, transportation, or disposition of any of this hazardous waste. The question then is, where and how is this hazardous waste being disposed of, and why has RSR/Quemetco failed to disclose this information on its biennial report?

4.4 Disposal of "non-hazardous" waste

The final slag produced by the electric-arc furnaces is sent to landfills. The waste is tested using the EPA Toxicity Characteristic Leaching Procedure (TCLP) test and sent to either a hazardous-waste landfill or a non-hazardous waste landfill according to the results. According to IDEM files, most of RSR/Quemetco's waste is electric-arc slag, and most of the slag is classified as non-hazardous by the TCLP test.

In 1991, the most recent year for which data is available from the EPA Toxic Release Inventory database, the Indianapolis plant sent 247 tons of lead, 155 tons of antimony, 22 tons of arsenic, 14 tons of copper, and one ton of nickel to off-site disposal. All "non-hazardous" waste was sent to the Danville Sanitary Landfill (now the Twin Bridges Landfill)

²⁶Memorandum from Sylvia Lowrance, Director, Office of Solid Waste, USEPA, to Hazardous Waste Management Division Directors, Regions I - X, April 26, 1989. The primary determination rests on whether the secondary material (the spent bags, gloves, etc.) is "commodity-like" — that is, whether the spent bags etc. truly have a value as a raw material or product. It is doubtful that spent bags with residual contamination by a listed hazardous waste could possibly be considered a commodity. The USEPA also notes (50 *Federal Register* 631, January 4, 1985) that an example of "sham recovery [is]... where material recovery is economically insignificant." Clearly, the thermal destruction of spent bags or gloves contaminated with air emissions or slag would recover economically insignificant amounts of lead, but would allow the evasion of costly requirements established to manage such wastes.

²⁷40 CFR 261.2(c)(3); 266.101.

in Danville, IN, and all hazardous waste was sent to the Adams Center Landfill in Fort Wayne. Similar or larger amounts of waste metals were disposed of in earlier years.

The TCLP test used to distinguish hazardous and "non-hazardous" waste measures the leachability of certain metals in mildly acidic water, in the presence of atmospheric oxygen. Lead and arsenic are among the metals measured in the TCLP test, but antimony is not.²⁸ As a result, waste will be classified as "non-hazardous" even if it contains large amounts of leachable antimony. Antimony is an extremely toxic substance, with a Maximum Contaminant Level (MCL) in drinking water set by USEPA at 6 $\mu\text{g}/\ell$, only slightly higher than the lead MCL of 5 $\mu\text{g}/\ell$.

The Twin Bridges Landfill, where some 100 tons per year of RSR/Quemetco's antimony is buried, states that it does not monitor surrounding waters for antimony. We recommend that these waters be monitored for antimony.²⁹

The potential costs of cleaning up improperly disposed slag are not insignificant. The Northside Landfill, a sanitary landfill north of Indianapolis where RSR/Quemetco formerly sent slag, is now a Superfund site. Under a Consent Decree, RSR/Quemetco is obligated to contribute 14.3% of all remediation costs above approximately \$3.5 million that has been collected in "cash-out" payments from certain PRPs. As the total remediation cost of the Northside Landfill and an adjacent, smaller site was estimated by USEPA at \$33.9

²⁸The USEPA classifies antimony as a hazardous constituent under 40 CFR 261 Appendix VIII, a Superfund hazardous substance under 40 CFR 302, and a SARA Title III toxic chemical under 40 CFR 372.65.

²⁹Furthermore, wastes received at this landfill are not segregated by type, so that RSR/Quemetco's slag is liable to be mixed with municipal garbage containing large amounts of organic matter. The decay of organic matter in municipal-waste landfills creates a strongly reducing and moderately acidic environment. The antimony in the slag can be expected to be in a reduced state initially. (Rubber waste is added to the melt to make the environment more reducing, and RSR reports that successive smelting steps in the lead reclamation process create an increasingly reducing environment, to the point that stibine gas is considered an occupational hazard at RSR's facilities.) In a sufficiently reducing and acidic environment, elemental antimony can react to form stibine gas (H_3Sb), which is extremely toxic. At present, landfill gas at Twin Bridges Landfill is monitored only for methane and carbon dioxide; this suggests that monitoring for stibine may also be needed.

million,³⁰ RSR/Quemetco's share of the cost can be roughly estimated at \$3 million to \$4 million.

Whether or not required by regulations, future disposal of slag should be into hazardous-waste landfills regardless of TCLP test results, unless it can be demonstrated that antimony will not leach in the reducing, acidic environment of a municipal-waste landfill.

4.5 Corrective action

RSR/Quemetco applied for authorization to operate hazardous waste storage and disposal piles in November 1980 under interim status (40 CFR 265). However, RSR/Quemetco failed to install a groundwater monitoring system, ensure adequate financial assurance, and apply for an operating permit by the stated deadline of November 8, 1985. Because of RSR/Quemetco's failure to comply with the law, its authority to store, treat, or dispose of hazardous waste on the waste piles was revoked automatically by the Hazardous and Solid Waste Amendments Act of 1984. Thus, RSR/Quemetco could no longer lawfully use the waste piles, although they remained in operation (active storage). During the 5-year period of noncompliance, hazardous waste and constituents were released into the environment.³¹

In 1986, the USEPA began a legal proceeding to force RSR/Quemetco to cease operating the waste piles, close the waste piles in compliance with the regulations, and to perform corrective action to cleanup the released hazardous waste. The legal proceedings were not resolved until April 1989, when RSR/Quemetco finally agreed in a consent decree to comply with the law by closing the units, beginning the corrective action phase, and paying fines of \$54,000. RSR/Quemetco was required to conduct a RCRA Facility Investigation (RFI) to determine the extent of contamination and install a groundwater

³⁰Superfund fact sheet, Northside Sanitary Landfill, Enviro-Chem Site, Zionsville, Indiana, December, 1986. This cost estimate includes a second, smaller Superfund site which is adjacent to Northside; we have assumed that most of the costs are due to the larger landfill.

³¹*United States of America v. Quemetco Inc., RSR Corporation, and Quemetco Realty*, U. S. District Court, Southern District of Indiana, CA IP-87-684C.

monitoring system. Wherever contamination is found above background levels in the soil, underlying groundwater, and adjacent surface waters, RSR/Quemetco must perform corrective measures to remove or decontaminate the contamination back to background levels. RSR/Quemetco is also required to provide financial assurance for the corrective action by establishing a trust fund of 1.2 times the cost of corrective measures.

A draft RFI report was prepared by RSR/Quemetco and submitted to EPA. This document is currently in draft form and thus unavailable from USEPA. Available correspondence indicates, however, that USEPA believes RSR/Quemetco has failed to fulfill its principal responsibility under the consent decree, to determine the extent of contamination. A letter from USEPA to RSR/Quemetco states that "the third revision of the draft [report] did not fully address the scope of the investigation as stated in the... Consent Decree."³² An attachment to this letter quotes the RSR/Quemetco report as saying "The primary aim of the investigation is to gather data to support development of a corrective measures plan to address the closure of the on-site slag pile." EPA instructs RSR/Quemetco that "the purpose of the investigation is to identify all potential source areas, identify and characterize all potential migration pathways, and to characterize the nature and extent of soil and water contamination in the study area (both on and off property)."

5. City of Industry, California

The RSR/Quemetco secondary lead smelter in City of Industry, California, illustrates how RSR operates in a climate of vigorous regulatory oversight and enforcement. In 1993, after years of violating and evading California regulations, the company pleaded guilty to criminal charges of illegally shipping hazardous waste as a non-hazardous material to an American-owned company in Tijuana, Mexico. RSR/Quemetco paid a \$200,000 criminal penalty and agreed to pay \$2.3 million for clean-up and medical care in Mexico. During the national debate leading up to the NAFTA vote, the site became symbolic of the way American companies take advantage of the lax regulatory climate in Mexico as a way to evade environmental regulations in the United States.

³²J. M. Boyle, USEPA, letter to G. A. Dumas, RSR Corporation, August 10, 1992.

The criminal conviction settled only one portion of the complaints against RSR/Quemetco. The California Dept. of Toxic Substances Control has charged RSR/Quemetco with many other violations of California hazardous-waste laws. These charges have not been resolved and have been referred to the state Attorney General's office for enforcement action. Violations alleged by the state include allowing hazardous waste to be dispersed by the wind, failure to submit required closure plans, inadequate financial assurance, and placing liquids in a waste pile that is only allowed to receive non-flowing solids. These violations are nearly identical to violations at the other RSR smelters.

RSR/Quemetco persists in its effort to evade California's hazardous waste laws. The slag which RSR/Quemetco was convicted of shipping to Tijuana as non-hazardous material is now shipped to Indianapolis as non-hazardous material.

Because of the ongoing state enforcement action, regulators are withholding many important documents concerning this site from public review, limiting the information available to prepare this report.

5.1 Background

The City of Industry facility dates back to 1970. The property occupies approximately 10 acres and is located in an industrial area approximately 1/2 mile from residential areas.

The RSR/Quemetco City of Industry facility is regulated by the state of California. Currently RSR/Quemetco is operating under an Interim Status Document for treatment, storage, and disposal of hazardous waste. Although RSR/Quemetco has submitted a Part B RCRA permit application, the State has requested that RSR/Quemetco revise its submittal because it was out-dated and not up to current standards. RSR/Quemetco has until the spring of 1994 to submit the revised application for receiving hazardous waste (from other sites), on-site treatment, storage, and recycling of hazardous wastes, and corrective action to clean

up existing contamination at the facility.³³ In 1987, USEPA performed a RCRA Facility Assessment which identified 44 solid waste management units (SWMUs) at the City of Industry facility, each of which requires further investigation.

5.2 Slag disposal

The City of Industry plant has both an electric-arc and a reverberatory furnace on-site, but RSR/Quemetco reports that only the latter has been used since 1989. Lead smelters produce drosses and slags which contain significant amounts of lead and other heavy metals. The regulation of these materials is stricter in California than in other states, and RSR/Quemetco has evaded the California rules by shipping the slag out of the state. RSR/Quemetco's export of the slag has repeatedly violated state laws and has led to criminal convictions for itself and a transporter.

In two significant areas, the three states in which RSR operates regulate lead smelters differently. These differences are crucial to understanding RSR/Quemetco's activities in California.

The first difference concerns hazardous-waste regulation of the smelter buildings. Indiana has ruled that the interior of the Indianapolis smelter building is completely exempt from hazardous-waste regulation under its recycling rules. (See Section 4.2.) New York and California consider these buildings to be hazardous-waste storage units.

Second, California regulations define hazardous waste more inclusively than the Federal regulations. Where classification of lead-bearing waste as hazardous under Federal regulations depends on the leachability of the lead, California defines any waste containing more than 0.01% lead as hazardous, regardless of the leachability. The final slag from the electric-arc furnace, which is not recyclable, is a hazardous waste under California

³³ In accordance with § 3004(u) of RCRA, to which the facility is subject in addition to state law, a facility that submits a permit application for a hazardous waste management facility must investigate whether there have been releases of hazardous waste or constituents from solid waste management units. If releases have occurred, appropriate corrective action measures become a condition of the operating permit.

regulations but often passes the Federal TCLP test which allows it to be classified as non-hazardous in New York and Indiana.

From 1988 until 1991, the "second-run" slag from City of Industry was shipped to Alco Pacifico, a recycler near Tijuana, Mexico, without hazardous-waste documentation. In 1993, RSR/Quemetco settled out of court with the Los Angeles County District Attorney on criminal charges of illegally shipping this waste to Mexico. The company pled no contest and agreed to pay \$2.5 million in penalties and restitution. Much of this amount will be used to pay for clean-up costs at Alco Pacifico's Tijuana plant and medical costs for nearby residents. Morris Kirk, the president of Alco Pacifico's American parent company, was also convicted of shipping the slag without hazardous-waste documentation and was sentenced to 16 months imprisonment.

Since 1991, "second run" slag from City of Industry has been shipped to the RSR/Quemetco Indianapolis facility for use as feedstock in its electric arc furnace. The slag is shipped by rail and, according to California regulators,³⁴ no hazardous-waste documentation is used. The California Hazardous Waste Rules³⁵ require any company shipping hazardous waste by rail to use a manifest.³⁶ RSR/Quemetco's compliance with this

³⁴Denise Hoffman, California Dept. of Toxic Substances Control, oral communication, January 28, 1994; Guillermo Hernandez, California Dept. of Toxic Substances Control, oral communication, February 3, 1994.

³⁵§66262.23(a) and (d); §66263.20(i).

³⁶Under some circumstances, the California Hazardous Waste Act [§25143.2(d)(3)] allows recyclable material to be shipped without hazardous-waste documentation between plants owned by the same company. However, by its terms this exemption is only available if the waste is handled in accordance with *California's* hazardous waste rules at the receiving facility and stops for no longer than 4 hours at any point in shipment. It is hard to see how a railroad could guarantee that a transcontinental shipment with no special documentation would not stop for 4 hours at some point.

Specifically, shipment to the Indianapolis plant must satisfy the conditions of §25143.2(d)(4)(A)(iii)-(iv) that "The material is not held at any publicly accessible interim location for more than four hours unless required by other provisions of law" and "The material is managed in compliance with the requirements of this chapter and the regulations... after the receipt of the material at the last location [Indianapolis] operated by the person." In our opinion, to qualify for the exemption, one must comply with these and four other conditions inside and outside California. That the conditions must be met outside as well as inside California can be seen from the condition [§25143.2(d)(4)(A)(v)] that the records of recyclable waste transfers be "maintained in an operating log at the last location..."; if the legislature had meant that these conditions need be met only within

rule deserves careful scrutiny, because only 8 months ago the company was convicted of the crime of shipping second-run slag without a manifest from City of Industry to a recycler that does not meet California standards.

5.3 Soil contamination

There are numerous areas of contaminated soil at RSR/Quemetco's City of Industry facility. These include a RCRA-regulated surface impoundment, RCRA-regulated hazardous-waste piles, and 44 solid-waste management units³⁷ identified by USEPA in a RCRA facility assessment in 1987.

Authorization to operate the surface impoundment was revoked in 1985 when closure of all noncomplying interim-status surface impoundments was required by law. Inspections by USEPA and CDHS showed that RSR/Quemetco ignored the requirement and continued to use its impoundment to manage hazardous waste. In October, 1986, USEPA filed a civil suit against RSR/Quemetco for this and other violations of hazardous-waste laws. The suit was settled in 1987 when RSR/Quemetco agreed not to place any more hazardous waste in the impoundment and paid a \$60,000 penalty.

In 1988, RSR/Quemetco submitted a closure plan for the inactive surface impoundment. Years of negotiations followed. At issue were the soil clean-up standard for lead and the correct method of chemical analysis to confirm that soil not removed fell below

California, it would have had the records kept in California.

In establishing this rule, California is not trying to extend its laws into Indiana — California leaves Quemetco free to do what it wants in Indianapolis but merely requires use of hazardous-waste manifests while the waste is within California if Quemetco does not choose to meet certain conditions.

³⁷The term "solid waste management unit" means any discernable waste management unit at a RCRA facility from which hazardous waste or hazardous constituents might migrate or have migrated, irrespective of whether the unit was intended for the management of solid and/or hazardous waste and regardless of when the waste was placed in the unit. Solid waste management units that operated before RCRA came into effect may contain material that would be classified as hazardous waste today.

the cleanup standard. According to California regulators,³⁸ a closure plan for the impoundment was recently approved. The closure plan provides for "clean-closure" of the impoundment, which generally denotes a clean-up to background levels or below MCLs. We have not seen the text of the closure plan.

Clean closure of the surface impoundment will be difficult to accomplish because of the facility's ground-water contamination problem. Some of this contamination undoubtedly originated from the impoundment. According to state regulators,³⁹

A large crack in the middle of the unit was observed [sic] during DHS inspections in *May 1984 and March 1985*. The surface was observed to be very uneven and small to medium sized cracks were observed. It is *highly possible that leaks to the subsurface soils and ultimately the groundwater could have occurred*. [emphasis in original]

Clean closure of a unit that has caused ground-water contamination requires that the ground water meet Maximum Contaminant Levels for drinking water. As discussed in the next section, ground water at RSR/Quemetco has been found to exceed MCLs for 8 metals.

Hazardous-waste piles continue to operate at RSR/Quemetco. Inspection reports and enforcement actions alleging that the waste piles are not properly contained were issued in 1985, 1986, 1988, 1990, 1991, and 1992. Control of waste piles was a major subject of the 1987 Consent Decree. DHS found 8 violations concerning waste storage in a 1990 inspection and 12 in a 1991 inspection. In both years, the agency found that RSR/Quemetco "has not managed their waste piles to avoid dispersal by wind," "has not protected the waste piles from precipitation and run on," and "placed hazardous wastes bearing free liquids in the... piles." These charges have been referred to the Attorney General's office for enforcement action.

³⁸Allan Plaza, California Dept. of Toxic Substances Control, oral communication, December 31, 1993.

³⁹Chronology of Quemetco surface impoundment permit closure history, California Dept. of Toxic Substances Control, undated.

Regulators indicate that a recent inspection found many of these violations to have been corrected, but the inspection report is not yet publicly available because of the ongoing enforcement action concerning past violations.

The hazardous waste piles which received free liquids should be classified as hazardous-waste surface impoundments under RCRA.⁴⁰ This is significant because requirements for surface impoundments concerning ground-water monitoring and runoff/runoff control systems are more stringent than for waste piles.

At present, little is known about the 44 SWMUs. RSR/Quemetco's delaying tactics have enabled the company to avoid characterizing what needs to be done for soil clean-up, and thereby have delayed the clean-up itself. It is imperative that California regulators move quickly to characterize the SWMUs.

5.4 Ground-water contamination

Ground-water contamination was detected at the City of Industry facility at least ten years ago. In the intervening time, RSR/Quemetco has repeatedly violated monitoring and reporting requirements and has not acted to clean up the problem.

RSR/Quemetco was first cited in 1984 by the California Dept. of Health Services for contaminating the ground water, for failing to monitor the ground water as required, for failing to report significant increases in ground-water contamination, and for failing to submit a ground-water assessment plan. Ground water was found to exceed drinking-water standards for lead, selenium, barium, chromium, cadmium, copper, iron, and mercury. In October 1985, RSR/Quemetco requested an exemption from RCRA ground-water monitoring requirements, but in a 1987 Consent Decree it agreed to conduct ground-water monitoring.

⁴⁰A waste pile is defined in 40 CFR 260.10 as "any non-containerized accumulation of solid, nonflowing hazardous waste that is used for treatment or storage." A surface impoundment is defined in 40 CFR 260.10 as "a facility or part of a facility which is a...diked area formed primarily of earthen materials (although it may be lined with man-made materials), which is designed to hold an accumulation of liquid wastes or wastes containing free liquids..." In both 1990 and 1991 inspections, RSR/Quemetco was found to have disposed of liquids in the piles.

After the 1987 Consent Decree, disputes concerning ground-water monitoring continued. A Phase I Ground-Water Monitoring Plan was finally approved in January, 1991. However, in February, 1992, EPA informed RSR/Quemetco that it was in violation of the Consent Decree for failing to comply with this plan, and subsequently RSR/Quemetco was charged by the State with a violation for failing three times during 1991 to submit required quarterly monitoring reports. These charges have not been resolved and were referred to the California Attorney General's office for enforcement action.

Little progress has been made toward clean-up of the ground-water contamination during these disputes over monitoring. The ultimate cost of remediation is difficult to estimate, because of RSR/Quemetco's failure to submit required data and the lack of public access to relevant files pertaining to the enforcement action.

5.5 Miscellaneous violations

Numerous other violations of California laws have been identified during inspections of RSR/Quemetco. Many of these have persisted over many years and are part of the current enforcement action. Among the most significant are:

- A 1987 inspection revealed that RSR/Quemetco did not possess a Waste Analysis Plan. The purpose of such a plan is to describe the method that will be used to obtain a sufficiently detailed chemical and physical analysis to allow the waste to be properly stored, treated, and disposed.
- A 1988 inspection identified violations of regulations relating to waste analysis, record keeping, employee training for hazardous waste management, emergency planning, and facility safety measures.
- A 1990 inspection revealed violations including improper record maintenance and improper storage and labeling of hazardous waste.
- A 1991 inspection identified twelve violations. These included all the violations cited in 1990, as well as the failure to manage battery acid in a way that protected workers and the environment and exceeding the 90 day storage limit for storing hazardous waste without a storage permit.

6. Wallkill, New York

RSR's Wallkill facility combines many of the elements from the other facilities: wide-spread soil contamination by lead, huge future costs associated with site remediation, and an upset local community.

6.1 Background and setting

The RSR secondary lead smelter in Wallkill, New York, operated by RSR's wholly owned subsidiary Revere Smelter and Refining Corporation, was constructed in the early 1970s. RSR/Revere acquired the facility in 1972 when it took over Quemetco, Inc. The plant has approximately 200 employees and includes both reverberatory and blast furnaces. The RSR/Revere smelter is located in a primarily rural area and contains ponds, a stream, and wetlands. Adjacent to the facility are parcels of undeveloped lands owned by RSR. Wallkill has a population of approximately 20,000 people, with residential areas located within 0.5 mile of the smelter's property boundary.

Numerous investigations spanning the last decade have revealed extensive soil contamination by lead and other heavy metals both on- and off-site. Also, lead levels in the local ground water and surface water are elevated. The contamination resulted from use of lead-bearing wastes as fill and from air emissions.

6.2 Regulatory status

A draft 6 NYCRR Part 373 hazardous-waste permit (equivalent to a RCRA Part B) was released for public comment on January 13, 1994.⁴¹ New York State Department of Environmental Conservation (NYSDEC) has scheduled a public information meeting for February 17, and the public comment period extends to March 11. NYSDEC proposes to issue a permit to the RSR/Revere facility for storage of spent lead-acid batteries and other lead-bearing wastes in two hazardous-waste storage areas: a battery storage area and a

⁴¹New York State Permit number 3-3352-00145/0001-0.

containment building. Included in the proposed permit is a general condition requiring corrective action measures to address existing contamination, but the nature of the required remediation is not specified.

A RCRA Facility Assessment revealed that the RSR/Revere facility contains several solid waste management units (SWMUs) and areas of concern (AOCs). These include waste piles, a container storage area, waste-water tanks, a fill area, on-site and off-site contaminated soil, and contaminated surface-water sediment. RSR/Revere is in the process of conducting a RCRA Facility Investigation. Rather than addressing each SWMU or AOC on a unit-by-unit basis, the RFI is being conducted on a site-wide basis.⁴² According to NYSDEC personnel, investigation of the on-site soil is complete, and investigation of the off-site soils (extending 300 feet from the smelter's property boundary) is underway. Ground-water and surface-water investigations, focusing primarily on lead contamination, are still in the data collection and analysis stage. Currently, eight monitoring wells exist on-site, and NYSDEC has requested that nine more be installed. A final RFI report and Corrective Measures Study⁴³ are scheduled to be available within one year.

In 1987, air monitors around the facility perimeter showed that emissions were exceeding the lead National Emissions Standard for Hazardous Air Pollutant (NESHAP).⁴⁴ In 1990, RSR/Revere and NYSDEC signed an Order on Consent⁴⁵ in which RSR/Revere agreed to take steps to reduce its fugitive emissions and substantially upgrade its emissions control systems. RSR/Revere paid a \$140,000 penalty and agreed to undertake an environmental sampling program to evaluate the impact of past air emissions on soils and ground water.

⁴²Resource Conservation and Recovery Act Facility Investigation, Task 1 report: Description of current conditions, Environmental Strategies Corporation, September 9, 1992, p. 5.

⁴³Corrective measure study plan, Environmental Strategies Corporation, July 2, 1993, Figure 1.

⁴⁴40 CFR 50.12. Under the Clean Air Act, the lead NESHAP is 1.5 $\mu\text{g}/\text{m}^3$ measured downwind of the source at the facility boundary.

⁴⁵New York State Department of Environmental Conservation Order on Consent Case #3-1508/8804, June 26, 1990.

6.3 Community activities

It is not surprising that there has been considerable community concern over the Wallkill plant. Two community action groups are active in issues involving the smelter: WAR (Wallkill Area Residents) and Orange Environment. WAR has been in contact with both RSR/Revere and state regulators. The NYSDEC has responded by establishing two public document repositories and is proposing to require that RSR/Revere draft a Community Relations Plan as part of its permit.

6.4 Waste handling

RSR/Revere has a history of relentlessly pushing to take full advantage of any loopholes in New York State's regulations which allow RSR/Revere to avoid handling its lead-bearing wastes as hazardous.

RSR/Revere spent years resisting NYSDEC regulators' efforts to have lead-bearing slags and other materials handled as hazardous waste. In February, 1991, RSR/Revere filed a Petition for Declaratory Ruling that argued (1) its slag is exempt from regulation as either a solid or a hazardous waste, and (2) sludge from its wastewater treatment system should not be classified by NYSDEC as hazardous waste. In May, 1991, RSR/Revere also filed for a variance from classification as a solid (and hence a hazardous) waste for lead-bearing materials stored in the furnace feed area. The January 13, 1994, draft Permit lists the containment building staging many of these materials as a hazardous waste storage unit; this may need additional clarification in future versions of the permit.

RSR/Revere's baghouse dust would normally be classified as listed hazardous waste K069 because it contains substantial quantities of lead and other heavy metals. However, RSR/Revere claims that it directly returns⁴⁶ the dust back into the furnace, making the dust

⁴⁶Emissions control dust from the bag house is conveyed to the furnace by a screw auger.

neither a solid waste nor a hazardous waste. This claim appears to be inconsistent with a statement in the Draft Permit that K069 dust is *stored* in the containment building.⁴⁷

RSR/Revere stages large quantities of slag and dross generated by the furnace. RSR/Revere also claims that these are not solid (or hazardous) wastes because they reclaim the lead by returning them to the furnace. Certain slags, called "second run" slags, are too impure to return to the reverberatory furnace and are stored until they are shipped off-site. RSR/Revere again claims these are not wastes, thus exempt from regulation as solid or hazardous wastes, because the lead they contain can be reclaimed. The "second run" slag is shipped off-site without a hazardous waste manifest to be melted in the RSR/Quemetco electric arc furnace in Indianapolis.

According to page 20 of the Waste Analysis Plan, which was part of RSR/Revere's 1992 permit application and is Attachment 1 to the 1994 draft permit, "Personal protective equipment that is contaminated with lead... [includes] Tyvek® suits, gloves, boots, respirators, and other forms of equipment. These materials either are *reclaimed* [in the furnace] or disposed." [Emphasis added.] As discussed in Section 4.3, throwing these items into the furnace is *not* reclamation because they are destroyed, leaving only the contaminating lead behind. This procedure is clearly treatment or disposal, for which RSR/Revere lacks the required permits.

6.5 Soil and ground-water contamination

Investigations by RSR/Revere's consultants have documented that large areas of land on and off RSR/Revere's property contain artificial lead-bearing fill. The fill, which is derived from slag and other lead-bearing wastes, was found to vary in thickness from several feet to approximately 20 feet and cover an area of more than two acres.⁴⁸ In one

⁴⁷Page 1 of the Draft Permit, under "Description of Authorized Activity" states: "The miscellaneous unit has a total capacity of 28,400 cubic yards for storing emissions control unit (K069)..."

⁴⁸Environmental Monitoring Plan report, Environmental Strategies Corporation, November 1, 1991, p. 19.

investigation,⁴⁹ the mean concentration of lead in 35 samples collected over a five-acre area was nearly 9000 mg/kg. The soil sample with the maximum concentration - 84,500 mg/kg - leached 796 mg/l of lead when subjected to USEPA's Extraction Procedure Toxicity Test.⁵⁰

In an investigation conducted in the summer of 1991, extremely high levels of lead contamination were also found in the soils beneath RSR/Revere's battery storage area, former gypsum pile area, and the process and storage yard.⁵¹ Maximum lead concentrations in all three areas exceeded 100,000 mg/kg. Seventy-six percent of the samples collected in these areas were classified as hazardous waste under the USEPA's Toxicity Characteristic Leaching Procedure (TCLP) for lead.

Soil samples collected by the NYSDEC, NYSDOH, and RSR/Revere's consultants show that airborne emissions have contaminated soil with lead and other heavy metals over a widespread area. The level of soil contamination appears to vary with depth and with direction and distance from the operations area. The most comprehensive investigation to date was performed in 1991 by RSR/Revere's consultant, Environmental Strategies Corporation (ESC). Thirty-seven soil samples collected from shallow boreholes at eleven locations between the operations area and the property boundary yielded lead concentrations that ranged from 7 mg/kg to 9000 mg/kg.⁵² Lead concentrations in twelve of the samples -- including nearly all of the uppermost samples -- were above 200 mg/kg and therefore

⁴⁹Site Characterization Report, Middletown, New York facility, Canonie Environmental, Table 1, May, 1989.

⁵⁰The purpose of the EP Toxicity Test was to establish a standardized measure of a material's tendency to leach toxic materials to ground water. If a material failed the test, it could be classified as a RCRA hazardous waste based on the characteristic of leachability. The standard for lead was 5 ppm. Although the EP Toxicity Test was replaced in 1990 by the Toxicity Characteristic Leaching Procedure (TCLP), which differs in some important ways, there can be little doubt that the sample would also qualify as hazardous waste under the more recent TCLP test because the lead standard of 5 mg/l remained unchanged.

⁵¹Environmental Monitoring Plan report, Environmental Strategies Corporation, Tables 5 through 7, November 1, 1991.

⁵²*Ibid.*, Table 8.

exceeded the highest estimate of natural background.⁵³ In general, the highest concentrations were found in the upper few inches, indicating that the elevated lead was derived from airborne emissions.

Thirty-three soil samples were collected by RSR/Revere's consultant from five deep boreholes at widely scattered off-site locations -- outside the facility fence, but still on RSR-owned land. These yielded lead concentrations that ranged from 13 mg/kg to 770,000 mg/kg (77%).⁵⁴ Again, the general trend was that the highest concentrations were found in the uppermost few inches, indicating an airborne source. However, the most contaminated of the borings was an exception to this trend and appeared to intercept an off-site area containing lead-bearing fill.

Ground-water samples collected during 1991, 1992, and 1993 by ESC and NYSDEC show that concentrations of lead, antimony, and other heavy metals have exceeded the NYS Part 703 Ground-Water Standard (GA - drinking water aquifer) in all eight monitoring wells. The NYS standard for lead is 25 $\mu\text{g}/\ell$. In five monitoring wells, the average total lead concentration exceeded 125 $\mu\text{g}/\ell$; in three wells the average concentration exceeded 500 $\mu\text{g}/\ell$. In one well, the maximum concentration exceed 23,000 $\mu\text{g}/\ell$. NYSDEC is requiring RSR/Revere to install at least 9 more monitoring wells to further delineate the extent of contaminated ground water.

NYSDEC and NYSDOH have jointly agreed that the Target Clean-up Level at the RSR/Revere site will be 250 mg/kg of lead in the soil and 15 $\mu\text{g}/\ell$ total lead in the ground water.⁵⁵ A letter to this effect is contained in Attachment III-E of the Draft Permit.

⁵³ESC's 1991 Environmental Monitoring Plan report (p. 80) states: "An internal NYSDEC memo has identified reported background lead concentrations of 17 mg/kg, 20 mg/kg and a range of 2 mg/kg to 200 mg/kg." Canonie Environmental's 1989 Site Characterization Report (p. 7) uses a background concentration of 150 mg/kg. ESC's 1992 RFI Task 1 report (p. 17) found a maximum concentration in "presumed background" samples of 180 mg/kg.

⁵⁴Environmental Monitoring Plan report, Table 9.

⁵⁵Letter from S. Kaminski, NYSDEC, to G.A. Dumas, RSR Vice President of Environmental Services, September 9, 1993, Subject: Target Cleanup Level, Cleanup Standard for Sodium Sulfate Project Site, RFI Workplan Outline: Off-Site Soil Investigations.

Because large areas of soil and ground water exceed this level, this implies that extensive clean-up will be required.

6.7 Closure and post-closure costs

The draft 6 NYCRR Part 373 Permit issued for public notice lists the containment building and the spent battery storage area as hazardous waste units. These two areas are therefore subject to all relevant RCRA closure and post-closure requirements. New York State regulations for hazardous waste disposal, as cited in RSR/Revere's closure plans, require that "The owner must provide a detailed description of the steps needed to remove or decontaminate *all* hazardous waste residues, contaminated containment systems, equipment, and soils during closure." [emphasis added]

RSR/Revere built the containment building in the operations area, where investigations have shown that the soil contains substantial amounts of lead-bearing fill. Before construction, RSR/Revere's consultant evaluated the potential effect of the construction on corrective action measures for the operations area.⁵⁶ Two options were evaluated at that time: (1) installing the pan-floor above the contaminated soil and existing pad and addressing the removal of the fill as part of final closure of the unit at some future date, or (2) excavation of the existing pad and all soils containing elevated levels of lead prior to construction of the new pan floor. In the end, RSR/Revere constructed the containment building directly above the contaminated soil; this means that RSR/Revere must include the clean-up of 38,700 square feet⁵⁷ of soils beneath the building's pan-floor in its cost estimates for closure of the unit.

Similar contamination exists beneath the battery storage area. As described above, nine of twelve soil samples collected beneath the battery storage area were hazardous waste

⁵⁶Evaluation of potential corrective measures on the pan floor building design, Environmental Strategies Corporation, November 1, 1991.

⁵⁷*Ibid.*, page 4.

under the TCLP,⁵⁸ demonstrating that substantial amounts of soil will have to be removed to satisfy clean-closure requirements. The battery storage area covers approximately 6000 ft².

The closure plans⁵⁹ for the two units state that "the battery storage area will be 'clean' closed..." and "the hazardous waste container storage area will be 'clean' closed." However, the closure plans do not include any soil removal in their budgets.

Fortunately, another document by the RSR/Revere consultants who prepared the closure plans gives sufficient information to estimate the per-square-foot cost of soil removal for clean-closure of the two units.⁶⁰ As part of a plan to install a sodium sulfate crystallization unit at RSR/Revere, ESC collected over 60 soil samples from six locations immediately east of the process area. The soil samples contained as much as 350,000 mg/kg (35%) lead. These data were then used to estimate the cost of two clean-up options, the second of which was "complete removal and replacement of the fill... effectively clean-closure."⁶¹ RSR/Revere's consultant estimated that clean-closing the area of 15,300 feet would cost \$5,723,000,⁶² giving a cost per square foot of \$374.

At \$374 per square foot, the estimated cost of clean-closing the 38,700-square-foot containment building is \$14,474,000. The estimated cost of clean-closing the 6000-square-foot battery storage area is \$2,244,000. These estimates, which total \$16,718,000, are only for soil remediation and do not include the costs of demolishing the buildings, disposing of contaminated building materials, and remediating contaminated ground water.

⁵⁸Environmental Monitoring Plan report, Environmental Strategies Corporation, Table 5, November 1, 1991.

⁵⁹Revere Smelting and Refining Corporation, Walkill, New York, Closure plan, Battery Storage Area, Environmental Strategies Corporation, April 15, 1991; Revere Smelting and Refining Corporation, Walkill, New York, Closure plan, Hazardous Waste Container Storage Area, Environmental Strategies Corporation, April 15, 1991.

⁶⁰Interim corrective measure (ICM) study for contaminated soil excavation at the crystallizer unit, Environmental Strategies Corporation, March 25, 1993.

⁶¹*Ibid.*, page 9.

⁶²*Ibid.*, Table 3.

6.8 Corrective action costs

Although difficult to estimate, the corrective action costs associated with this facility appear to be huge. If NYSDEC abides by its decision to hold RSR to a soil clean-up level of 250 mg/kg and a ground-water clean-up level of 15 $\mu\text{g}/\ell$, then RSR will potentially have to address tens of acres of surface soil, acres of lead-bearing fill (which is as thick as twenty feet in some places), and a substantial amount of contaminated ground water. Our estimate is that excavation of the soil could cost many tens of millions of dollars and that the less expensive alternative of capping the soil could still cost millions.

7. Financial assurance

7.1 Financial assurance for closure and post-closure costs

A company that manages hazardous waste is required to provide financial assurance to ensure that there will be funds available for closure and post-closure care of its hazardous-waste management facilities. The financial assurance must be based on a detailed written cost estimate for closure and, when applicable, post-closure. There are two primary ways to demonstrate financial assurance. Money can be set aside through a trust fund, surety bond, or similar mechanism. Alternatively, the company (or another company that provides a guarantee) can demonstrate a tangible net worth and a net working capital more than six times the total closure and post-closure costs for which the company assets are being used to provide financial assurance. If financial assurance is shown by the latter test, net worth and working capital must be shown by an audited financial statement.

A corporate guarantee, accompanied by a financial statement, was provided by RSR Corp. to New York regulators on March 30, 1993.⁶³ RSR's estimate of closure and post-

⁶³A similar guarantee was provided to California regulators on the same day. California Dept. of Toxic Substances Control staff have indicated to us that this guarantee was subsequently replaced by a bank trust agreement, but they were not immediately able to locate the text of this agreement in their files. At City of Industry, Quemetco most recently estimates its closure costs at \$2,163,476.

closure costs at Wallkill is \$116,379. This is substantially less than our estimate of \$16,718,000 for just the soil remediation portion of these costs.

The financial statement that RSR Corp. submitted to New York regulators gives RSR Corp.'s consolidated tangible net worth as \$102,193,102 and its net working capital as \$73,242,967, as of December 31, 1992. According to financial data⁶⁴ filed by RSR with California regulators,⁶⁵ these sums include \$39,232,335 owed to RSR Corp. by its parent company, RSR Holding Corp. RSR Holding Corp.'s financial statement, however, shows only \$3,438,241 in assets other than its investment in RSR Corp. Because such a large portion of RSR Corp.'s assets consists of debt from RSR Holding, we seriously question whether the funds available to meet claims on RSR Corp. are likely to exceed the consolidated assets of RSR Holding. RSR Holding Corp.'s financial statement shows that its net tangible assets are less than \$70 million and its net working capital is \$33,421,028.⁶⁶

RSR Holding's tangible net worth and net working capital are both less than six times \$16,718,000, the partial cost of clean-closing the Wallkill storage units as calculated above.⁶⁷

⁶⁴Consolidated financial statements and supplementary information, RSR Holding Corp. and subsidiaries, years ended December 31, 1992 and 1991, with report of independent auditors.

⁶⁵The financial statement submitted to New York regulators is not available to us because RSR claims it is confidential business information, and NYSDEC has not yet ruled on this claim.

⁶⁶The authors of this report are not financial analysts and invite readers to examine the materials filed by RSR with regulatory agencies.

⁶⁷Some of the remediation activities at the Dallas and Harbor Island Superfund sites serve to close units that RSR subsidiaries operated under interim status (or should have placed under interim status). Also, in Indianapolis, financial assurance for waste pile closure is provided by a trust fund to which RSR/Quemetco's contribution is limited to \$10,000 per month; costs of the required clean-closure are likely to greatly exceed the amount contributed to date.

New York regulators should consider whether these costs have been adequately disclosed and provided for. Note that the financial assurance statement (S. M. Anderson, RSR, letter to M. E. O'Neil, NYSDEC, March 30, 1993) provided by RSR in satisfaction of New York requirements states:

The firm identified above owns or operates the following hazardous waste management facilities for which financial assurance for closure or, if a disposal facility, post-closure care, is not demonstrated... NONE.

7.2 RSR's overall ability to meet environmental responsibilities

RSR Holding Corp.'s net assets, according to its December 31, 1992, financial statement, were less than \$70 million. If these assets, plus any future earnings the company may have, are not sufficient to cover its environmental responsibilities, additional funds will be needed.

As described above, the expenditures potentially required of RSR Corp. and its subsidiaries for environmental purposes are large. The company operates, or has operated, five lead smelters, all of which have large-scale contamination and two of which are listed or proposed Superfund sites. The company is a Potentially Responsible Party at several other Superfund sites. At just one of them, the Northside landfill where it formerly disposed of slag from the Indianapolis plant, its share of clean-up costs is approximately \$3 million to \$4 million. The landfill where most of the Indianapolis slag is now disposed is not monitored for antimony and its compounds, which are major potential contaminants in the slag. Furthermore, RSR is the principal defendant in two class-action lawsuits alleging health damages at its former Dallas smelter.

The largest clean-up responsibilities are likely to be at the five smelters. It is useful to compare the likely clean-up costs at these facilities to available assets.

The assets available to meet these responsibilities are (leaving aside any speculative future earnings) the net assets less future payments for other Superfund sites and the class-action lawsuits. Dividing something less than \$70 million among five sites gives an average of \$14 million per site or less.

The only two of the five smelters where even a rough, partial estimate of remediation costs can be made are Harbor Island and Wallkill. At Harbor Island, RSR should be responsible for a large portion of a \$15,000,000 soil cap, a relatively small portion of ground-water monitoring costs, and an unknown amount for sediment remediation. At Wallkill, RSR is responsible for closure of RCRA units at a cost estimated above at \$17 million, corrective action for on-site soil at a cost likely to be in the millions or tens of millions, corrective action for ground water at an unknown but probably large cost, and

unknown potential expenses for off-site soil remediation. The other three sites seem to be comparable to these two in the magnitude of contamination:

- City of Industry has 44 SWMUs and contaminated ground water.
- Dallas is a Superfund site where clean-up costs have reportedly been estimated at \$8 million to \$25 million for just *one* of five operable units.
- Indianapolis has extensive lead contamination which must be cleaned up to background levels under a consent decree.

If anything, Wallkill costs are more likely to be characteristic of the other three sites than Harbor Island. Harbor Island's unique location on an uninhabited island reduces the potential routes of human exposure to contamination, as a result of which USEPA and the State of Washington have adopted unusually modest clean-up targets.

RSR has not demonstrated that it has sufficient assets to cover future closure and corrective action costs. A prudent course of action would be to require RSR to establish trust funds or equivalent means of financial assurance to cover the entire estimated cost of closure, post-closure and corrective action. This would help to ensure that the currently RCRA-regulated sites do not in the future become a taxpayer responsibility under Superfund. Such trust funds would also give regulators a means of ensuring rapid progress if RSR persists in inadequate fulfillment of corrective action requirements.

8. Principal conclusions

The history and current practices of waste management at RSR's facilities display a consistent pattern of massive resistance by legal and illegal means to efforts to investigate and clean up environmental problems.

A clear pattern of behavior emerges, followed repeatedly at all RSR sites. The company operates hazardous-waste units without legal authorization under RCRA or, when units are authorized, fails to comply with the most basic requirements of RCRA. When cited for violations, it either raises legal objections or seeks variances, all the while failing to correct the violations and operating under the conditions for which cited. After years of

enforcement activity, during which the same violations are repeatedly cited by regulators, RSR eventually signs consent decrees in which it agrees to correct the violations. RSR then delays complying with the consent decrees. In particular, expensive corrective action is avoided by failing to comprehensively investigate contamination problems in defiance of the consent decrees.

While RSR has been repeatedly penalized and in one case was convicted of a crime for this behavior, the penalties have been far smaller than the cost of the clean-up activities that RSR has succeeded in delaying into the indefinite future.

The pattern of resistance to environmental regulation demonstrated by this report calls for enforcement to be coordinated at the national level. We recommend that USEPA, working with state governments, bring RSR into full compliance with the law through its Multimedia Enforcement Initiative.

It is important to ensure that sufficient financial resources will be available to clean up existing and future contamination at RSR's plants to prevent the burden from falling on the taxpayer. The combined net assets of RSR and its parent company that could be made available to clean up the five smelters and meet other environmental expenses are, as we understand it, less than \$70 million. Thus an average of less than \$14 million per smelter is available. At the two smelters where reasonably complete information is available, clean-up costs appear to be at least \$10 million to \$20 million per site. In view of this, and considering RSR's pattern of resistance to clean-up requirements, regulators at all sites should require RSR to provide trust funds or the equivalent for the total anticipated cost of closure, post-closure activities, and remedial actions.